

METADATA FOR THE 2002 MERCED COUNTY LAND USE SURVEY DATA

Originator:

California Department of Water Resources

Date of Metadata:

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Abstract:

The 2002 Merced County land use survey data set was developed by DWR through its Division of Planning and Local Assistance. The data was gathered using aerial photography and extensive field visits, the land use boundaries and attributes were digitized, and the resultant data went through standard quality control procedures before finalizing. The land uses that were gathered were detailed agricultural land uses, and lesser detailed urban and native vegetation land uses. The data was gathered and digitized by staff of DWR's San Joaquin District and the quality control procedures were performed jointly by staff at DWR's DPLA headquarters from San Joaquin District.

The finalized data include DWG files (land use vector data) and shape files (land use vector data).

Purpose:

This data was developed to aid in DWR's efforts to continually monitor land use for the main purpose of determining the amount of and changes in the use of water.

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Data Development:

1. The digital imagery used for the field work for this survey was satellite imagery from the summer of 2001. The imagery was developed using 30 meter multispectral imagery from Landsat 7 and 5 meter panchromatic imagery from the IRS (Indian) satellite. The resulting imagery used was a merge of the two resulting in a natural color image with 5 meter pixels size.
2. These images were copied onto laptop computers that were used as the field collection tools. The staff took these laptops in the field and virtually all the areas were visited to positively identify the land use. No land use boundaries (vector lines) were used in the site visits. The site visits occurred in July through September 2002. Land use codes were digitized directly in the laptop computers using AUTOCAD (using a standardized digitizing process). Any land use boundaries that were not apparent in the imagery, or changes from 2001, were drawn on-screen in the field.
3. After the field survey, staff used AUTOCAD (using a standardized digitizing process) with the satellite imagery as a backdrop to delineate the land use boundaries on-screen. The attributes were already digitized into the files during the site visits.
4. After quality control/assurance procedures were completed on each file (DWG), the data was finalized for the summer survey. Using ARC/INFO, shape files were created for the summer survey.
5. Satellite imagery (Landsat 7) from March 2002 was used to further process the data. The dairy industry is huge in Merced County, and DWR wanted to capture the acreage that was planted to wheat in the winter and green-chopped in the spring (in April). DWR made an assumption that the fields that were identified as either corn or fallow in the summer would be the only fields that could have had the green-chop wheat grown.

Using summer identified wheat fields as wheat training sites, and fields that were fallow (visibly) in the spring (using the March imagery) as fallow training sites, an image-wide classified scene was created. The classified pixels under the summer identified corn and fallow fields were sampled and identified by whichever had the higher percentage of pixels. For instance, if a corn field had 82 percent of the pixels under it classified as wheat in the spring (meaning that 18 percent, or the remaining pixels, were classified as fallow), we added a wheat attribute to that field. That field changed from a single crop of corn to a double crop of green-chopped wheat followed by corn.

Much editing of field boundaries was done because many times a summer identified corn field might have had only half of the

field planted to green-chopped wheat, and to be accurate, the field had to be subdivided into two corn fields, one that had wheat planted, and the other that didn't.

A final county wide shapefile was created that incorporated the satellite image identified green-chop wheat.

Data Accuracy:

The land use boundaries were drawn on-screen in AUTOCAD using the orthorectified satellite imagery as a backdrop. The resultant digital linework for those areas is 50 foot accuracy.

The land use attribute accuracy is very high, because almost every delineated field was visited in the field. The accuracy is less than 100 percent because some errors must have occurred. There are three possible sources of attribute errors which are:

- 1) Misidentification of land use in the field (and digitizing that incorrect attribute in the laptop computer); or
- 2) Correct identification of land use, but digitizing an incorrect attribute in the laptop computer.

Projection Information:

The data (DWG and shape files) are in a transverse mercator projection, with identical parameters to UTM projections, except the central meridian is -120 degrees (120 degrees west). For comparison, UTM 10 has a central meridian of 123 degrees west, and UTM 11 has a central meridian of 117 degrees west. This projection allows virtually all of the geographic area of California to be in one 6 degree zone (as opposed to two zones, UTM 10 and 11).

Projection:	Transverse Mercator
Datum:	NAD27
Units:	Meter
Scale Reduction:	0.9996
Central Meridian:	120 degrees west
Origin Latitude:	0.00 N
False Easting:	500,000
False Northing:	0.00

Land Use Attributes:

All land use attributes were coded using the Department's Standard Land Use Legend dated March 1999 (98legend.pdf). The legend explains in detail how each delineated area is attributed in the field, and what the coding system is.

The actual land use coding given in the legend is different in arrangement than the codes that result from the digitizing process.

The file attributes.pdf is a detailed explanation of the coding system from the legend and the codes that end up in digitized form in the database files associated with the shape files.

Information on the AUTOCAD (DWG) Files:

The land use data is available in AUTOCAD 12 format by quad, with one file per quad. The file naming convention is 02MEXXXX.DWG, where XXXX is the DWR quadrangle number. For example, file 02ME3832.DWG is the AUTOCAD drawing file for the 2002 Merced County land use survey for quadrangle 3832 (the Atwater quad).

Every quadrangle file has identical layers, nomenclature, and line colors. They are as follows:

Layer	Description	Color
0	AutoCAD's default layer	White
CQN	California DWR quad number	Cyan
GSN	USGS quad number	Cyan
LUB	Land use boundary lines	Yellow
LUC	Land use codes for GRASS	White
LUT	Visible land use text	Green
QB	The quad's boundary	White
QN	Quad name	Cyan

Following is an explanation of the attributes (for each delineated area) in the LUC layer of each quad file:

ACRES:	Number of acres in the delineated area (may or may not be present)
WATERSOURC:	The type of water source used for the delineated area
MULTIUSE:	Type of land uses within the delineated area
CLASS1:	The class for the first land use
SUBCLASS1:	The subclass for the first land use
SPECOND1:	The special condition for the first land use
IRR_TYP1:	Irrigated or non-irrigated, and irrigation system type for the first land use
PCNT1:	The percentage of land associated with the first land use
CLASS2:	The class for the second land use
SUBCLASS2:	The subclass for the second land use
SPECOND2:	The special condition for the second land use
IRR_TYP2:	Irrigated or non-irrigated, and irrigation system type for the second land use
PCNT2:	The percentage of land associated with the second land use
CLASS3:	The class for the third land use
SUBCLASS3:	The subclass for the third land use
SPECOND3:	The special condition for the third land use
IRR_TYP3:	Irrigated or non-irrigated, and irrigation system type for the third land use

PCNT3: The percentage of land associated with the third land use

Information on the Shape Files:

Shape files were created for each quad, and two for the whole survey area. The naming convention used for the quad DWG files is used for the quad shape files (for example, 02ME3832.shp, 02ME3832.shx, and 02ME3832.dbf for quad number 3832, the Atwater quad). The name of the shape file for the whole survey area (summer survey results) is 02ME.shp (and .dbf and .shx). The name of the shape file for the whole survey area including the green-chop wheat is 02MEint.shp (and .dbf and .shx). Following is an explanation of the land use attributes in the DBF files:

BL_X: This is the X coordinate of the interior point in the delineated area

BL_Y: This is the Y coordinate of the interior point in the delineated area

ACRES: Number of acres in the delineated area (may or may not be present)

WATERSOURC: The type of water source used for the delineated area

MULTIUSE: Type of land uses within the delineated area

CLASS1: The class for the first land use

SUBCLASS1: The subclass for the first land use

SPECOND1: The special condition for the first land use

IRR_TYP1A: Irrigated or non-irrigated for the first land use

IRR_TYP1B: Irrigation system type for the first land use

PCNT1: The percentage of land associated with the first land use

CLASS2: The class for the second land use

SUBCLASS2: The subclass for the second land use

SPECOND2: The special condition for the second land use

IRR_TYP2A: Irrigated or non-irrigated for the second land use

IRR_TYP2B: Irrigation system type for the second land use

PCNT2: The percentage of land associated with the second land use

CLASS3: The class for the third land use

SUBCLASS3: The subclass for the third land use

SPECOND3: The special condition for the third land use

IRR_TYP3A: Irrigated or non-irrigated for the third land use

IRR_TYP3B: Irrigation system type for the third land use

PCNT3: The percentage of land associated with the third land use

UCF_ATT: Concatenated attributes from MULTIUSE to PCNT3

Important Points about Using this Data Set:

1. The land use boundaries were drawn on-screen using orthorectified imagery. They were drawn to depict observable areas of the same land use. They were not drawn to represent legal parcel (ownership) boundaries, or meant to be used as parcel boundaries.
2. If the data is to be brought into a GIS for analysis of cropped (or planted) acreage, two things must be understood:
 - a. The acreage of each field delineated is the gross area of the field. The amount of actual planted and irrigated acreage will always be less than the gross acreage, because of ditches, farm roads, other roads, farmsteads, etc. Thus, a delineated corn field may have a GIS calculated acreage of 40 acres but will have a smaller cropped (or net) acreage, maybe 38 acres.
 - b. Double and multicropping must be taken into account. A delineated field of 40 acres might have been cropped first with grain, then with corn, and coded as such. To estimate actual cropped acres, the two crops are added together (38 acres of grain and 38 acres of corn) which results in a total of 76 acres of net crop (or planted) acres.
3. Water source information was not collected for this survey.
4. For this survey, a new special condition attribute was created. It is "C", for green-chop, and is only used with grain (wheat) that is green-chopped.